The rejection of the four independent nozzle claims and the three independent automatic metering method claims, over Peck and Lindsay or Lindsay and Peck, is traversed. The independent claims being allowable, applicant submits that the dependent claims are allowable without more. The independent claims will be argued, and claim 1 taken as essentially representative, in the circumstances.

Traversal – In General

Re "Foam Proportioning" Nozzles

Peck teaches what is sometimes called a "foam proportioning" nozzle, that is, a nozzle having an additive passageway in fluid communication with a fire fighting liquid conduit in the nozzle. (See first half of first element of independent nozzle claims 1-4. See equivalent phrases in independent method claims 10-12, e.g. "an additive passageway in fluid communication with a fire fighting liquid conduit of the nozzle;" "in a passageway for additive located inside of the nozzle body.") "Foam proportioning" nozzles add foam concentrate to the water at the nozzle. The nozzle itself has a foam conduit in fluid communication with a water conduit.

Other foam proportioning nozzle designs are disclosed in US patents 4, 497,442; 5,275,243; and 5,012,979. A supplemental IDS is included herewith listing those patents. These additional patents are cumulative to, and duplicitous of, the foam proportioning nozzle of Peck. They are submitted simply to clarify that "foam proportioning" nozzles, per se, having an additive passageway of the nozzle in fluid communication with a fire fighting liquid conduit of the nozzle, comprise a type of fire fighting nozzle.

Re : "Self Metering Nozzle"

The Examiner, however, wrongly cites Peck as an instance of a "self-metering" nozzle. While Peck discloses a foam proportioning nozzle, as above, Peck does not disclose a "self metering" nozzle. The term "self-metering" nozzle refers to automatically metering additive with respect to a nozzle, or adjusting the flow of additive in accordance with adjustments in flow of the main fluid through a nozzle.

Lindsay also is wrongly cited here for disclosing a "self-metering nozzle." Lindsay discloses a "self-metering proportioning apparatus." There is no teaching or suggestion in Lindsay that his self-metering proportioner could be incorporated into an industrial scale fire fighting nozzle. There is no evidence of motivation presented for such incorporation, nor any evidence of a reasonable expectation of success. Lindsay does not teach a self-metering feature in an industrial scale fire fighting nozzle. Rather, Lindsay teaches "self metering" in a proportioner. The engineering requirements and specifications and structure and arrangements of elements for an industrial scale fire fighting nozzle and for an upstream proportioner apparatus are quite different.

Re "Automatic Nozzle"

The Examiner also wrongly cites Lindsay as an instance of an "automatic nozzle," for much the same reasons. Lindsay's proportioner maintains a constant pressure drop at the point of injection of the additive. Lindsay does not disclose an "automatic" industrial scale fire fighting nozzle, however, a discharge pressure regulating nozzle. Again, the engineering requirements and specifications for an industrial scale fire fighting nozzle and an upstream proportioner are quite diverse.

The Examiner acknowledges that Peck does not disclose an automatic nozzle.

[Steingass does disclose an automatic (i.e. discharge pressure regulating) nozzle. See Steingass column 5, lines 15-18. Other automatic (e.g. discharge pressure regulating) nozzle designs are known, as illustrated by patents 3,539,112; 3,863,844; and 3,684,192. These cumulative and duplicitous patents are also included on an attached information disclosure statement, in order to illustrate that Steingass is not unique in teaching an "automatic nozzle." These nozzles are a type of fire fighting nozzle.]

The Invention

To applicant's knowledge, applicant is the first to combine a "foam proportioning" nozzle with an "automatic" nozzle and with a "self metering nozzle." Applicant, to applicant's best knowledge, is the first to teach the advantages of and the benefits of the combination, to test and to experiment with such nozzles and to solve the engineering problems associated with creating such a combination and prove that the combination is feasible. Applicant's self-metering automatic foam proportioning nozzle, in fact, required extensive testing and experimentation to establish that the objectives could be achieved without unacceptable weight, unacceptable expense, unacceptable complexity, unacceptable pressure drop, unacceptable turbulence, etc., to mention a few issues. The success of applicant's experiment could not have been reasonably expected. The extensive experimentation effort was motivated by applicant's unique vision of the benefits of the combination.

Traversal Specifically: Re Claim Elements and Peck and Lindsay

In General

The independent nozzle claims herein (claims 1-4) recite a fire fighting fluid conduit in the nozzle that has a discharge orifice that varies in size with supply pressure of the liquid to the nozzle, a feature of an automatic or discharge pressure regulating nozzle. The nozzle claims do not recite a fire fighting nozzle liquid conduit with merely a manually variable discharge orifice, as per Peck. So-called "fixed flow" nozzle designs, the oldest and most popular nozzle design, usually have a manually variable discharge orifice that provides a manually selectable fixed flow discharge orifice. Peck's discharge orifice, defined between lip 30 and slope 58, can only be manually varied through the adjustment of screw threads 52 and 54. Peck does not teach or disclose "a discharge orifice that varies in size with supply pressure of the liquid." The Examiner agrees that he does not.

Lindsay does not disclose an industrial scale fire fighting nozzle as part of his proportioning apparatus. Lindsay's nozzle is indicated as lying downstream, being equipment benefiting from his proportioner, which is the subject of Lindsay's invention. Lindsay discloses pressure regulating in his proportioner in the sense of maintaining a pre-designed pressure drop in the proportioning apparatus at the point of insertion of the additive in order insure insertion of additive rather than water flowing back up the additive passageway. This is a known technique.

Lindsay does not disclose structural elements defining a variable opening associated with an additive passageway of and in an industrial scale fire fighting nozzle. Likewise, Lindsay does not disclose elements structured in combination to automatically vary an additive opening size in response to variations in size of the discharge orifice of that nozzle. Lindsay does not vary an additive opening in response to variations in size of a discharge orifice of that nozzle. The differences in structure correspond to differences in function and result in the two different apparatuses.

Claims

Claim 1 will be addressed, as representative of the independent claims. Claim 1 will be broken down into 7 elements, elements (1)-(7). Technically, Peck does not teach or disclose the first, second, fifth or seventh elements. Lindsay does not teach or disclose the second, fourth, fifth, sixth or seventh elements. Importantly, neither Peck nor Lindsay teach or disclose the fifth or seventh elements.

Further, there is no evidence of motivation to make the Examiner's asserted combination of elements from disparate apparatus. There is no evidence of how to, or why to, make the asserted combination. The Examiner does not disclose, for either asserted combination, how the necessary elements would fit together, where they would go, how they could be incorporated together, how they would work.

Claim 1

(1) A self-metering

(2) automatic

(3) industrial scale fire fighting **nozzle**, comprising:

(4) an additive passageway in fluid communication with a fire fighting liquid conduit **of the nozzle**,

(5) the conduit having a discharge orifice that varies in size with supply pressure of the liquid, at least for part of the flow range of the nozzle; and

(6) structural elements defining a variable opening associated with **the** additive passageway,

(7) the elements structured in combination to automatically vary **the** opening size in response to variations in size of **the** discharge orifice.

Element by Element Analysis

(1) Self-Metering

As discussed above, neither Peck nor Lindsay teach a "self-metering nozzle." Lindsay teaches a self-metering proportioner apparatus, with no teaching or suggestion or motivation to incorporate his proportioning apparatus into an industrial scale fire fighting nozzle. Such in fact would create an uneconomic duplication of equipment for Lindsay.

(2) Automatic

Neither Peck nor Lindsay disclose an "automatic (that is, a discharge pressure regulating) nozzle." Peck does not disclose an automatic feature. Lindsay shows an automatic pressure drop feature in a proportioning apparatus. (Steingass discloses an automatic nozzle.)

(3) Industrial Scale Fire Fighting Nozzle

Peck and Steingass disclose an industrial scale fire fighting nozzle. Lindsay merely indicates that such a nozzle could be attached downstream from his proportioning apparatus.

(4) An Additive Passageway in Fluid Communication with the Fire Fighting Liquid Conduit of the Nozzle

Peck discloses a nozzle having an additive passageway in fluid communication with a fire fighting liquid conduit of the nozzle. Lindsay teaches an additive passageway in fluid communication with a fire fighting liquid conduit in a proportioning apparatus, not in an industrial scale fire fighting nozzle. (Steingass does not disclose an additive passageway in fluid communication with a fire fighting liquid conduit of the nozzle.)

(5) The Conduit Having a Discharge Orifice that Varies in Size with Supply Pressure of the Liquid

**Peck does not disclose a nozzle having a fire fighting liquid conduit with a discharge orifice that varies in size with supply pressure of the fire fighting liquid. Peck's discharge orifice varies in size manually.**

**Lindsay does not disclose a nozzle having a discharge orifice that varies in size with supply pressure of the liquid. Lindsay discloses a conduit of a proportioner that has an interior orifice that varies in size with supply pressure of a liquid.**

**(Steingass discloses a nozzle conduit having a discharge orifice that varies in size with supply pressure of the liquid.)**

(6) Structural Elements Defining a Variable Opening Associated with the Additive Passageway

Peck discloses structural elements defining a variable opening associated with the additive passageway, (but those structural elements are structured to vary manually, by screwing in and out. See below.) Lindsay's structural elements defining a variable opening associated with an additive passageway are not associated with a passageway of an industrial scale fire fighting nozzle, as above. (Steingass does not disclose structural elements defining a variable opening associated with an additive passageway.)

**(7) The Elements Structured in Combination to Automatically Vary the Opening Size in Response to Variations in Size of the Discharge Orifice.**

**Peck does not disclose elements structured in combination to automatically vary the opening associated with the additive passageway (mentioned above) in response to variations in size of the of the industrial scale fire fighting nozzle discharge orifice, (the additive passageway being that passageway of the nozzle in fluid communication with the fire fighting liquid conduit of the nozzle.) Peck discloses elements structured in combination to manually adjust to vary the additive opening, as by screwing in and out.**

**Lindsay does not disclose elements structured in combination to automatically vary the opening size of an opening associated with an additive passageway of an industrial scale fire fighting nozzle, in response to variations in size of the discharge orifice of the fire fighting nozzle. Lindsay discloses elements structured in combination to automatically vary an opening of an additive passageway of a proportioning apparatus in response to variations in size of an interior orifice within the proportioning apparatus.**

Summary of the Differences

To summarize: (1) Peck does not teach self-metering. Lindsay does not teach self-metering in an industrial scale fire fighting nozzle. (2) Neither Peck nor Lindsay teach an automatic, discharge pressure regulating, industrial scale fire fighting nozzle. (Lindsay teaches a proportioner automatically maintaining a constant pressure drop; Lindsay's additive passageway is not in fluid communication with a fire fighting liquid conduit of a nozzle.) (3) Peck does not teach a discharge orifice of a nozzle that varies in size with supply pressure of the liquid. Lindsay does not teach a discharge orifice of an industrial scale fire fighting nozzle that varies in size with supply pressure of the liquid. (4) Peck does not teach elements structured in combination to automatically vary a variable opening associated with an additive passageway of a nozzle in response to variations in size of the discharge orifice of the nozzle. Lindsay likewise does not teach these structural elements in an industrial scale fire fighting nozzle.

Motivation for the Asserted Combination

The Examiner has not presented evidence of motivation for attempting to incorporate the asserted selected elements of Lindsay's proportioning apparatus into an industrial scale fire fighting nozzle. The Examiner has not presented any evidence of how it could be done, of what would go where, or of how it would work. There is no evidence of reasonable expectation of success for making the Examiner's asserted combination without undo experimentation, even if one were to attempt such. Applicant himself witnesses to the fact that proving his nozzle design took extensive experimentation, trial and error, testing.

Independent Nozzle Claims 2-4

Independent nozzle claims 2-4 differ from independent nozzle claim 1 in the statement of the last two elements, as numbered above, elements (6) and (7.) Independent claims 2, 3 and 4 recite, for element (6), "a valve associated with the additive passageway;" "means for variably occluding the additive passageway;" and "an adjustable opening in the additive passageway," respectively. For element (7) above independent claims 2, 3 and 4 recite, "the valve structured to automatically vary in combination with variations of the discharge size;" "variably occluding in conjunction with variations of the discharge orifice size;" and "calibrated to automatically adjust in response to variations of the discharge size," respectively. Applicant submits that the same comments as applied above in regard to elements (6) and (7) of claim 1 apply to the variations of those elements found in claims 2, 3 and 4.

Independent Claims 10, 11 and 12

Method Claims

Method claim 10 will be taken as representation and is divided into elements, similar to the elements of nozzle claim 1. The elements are numbered as similarly as possible to the numbering adopted in analyzing independent claim 1.

(1) A method, comprising: automatically metering a pre-selected ratio of additive

(2) (5) into an automatic (pressure regulating, at least in part)

(3) industrial-scale fire fighting nozzle,

(6) including adjusting at least one occluding element in

(4) an additive passageway in fluid communication with a fire fighting liquid conduit of the nozzle

(7) in accordance with a varying discharge orifice of the fire fighting liquid conduit.

Independent method claim 11 differs only in that element 6 is simply "including occluding."

Independent method claim 12 differs in that element 2 recites into 'a self-educting' automatic (pressure regulating, at least in part.)" Element 4 recites "in a passageway for additive located inside the nozzle body." Element 6 recites "including valving the passageway." Element 7 recites "in tandem with a varying discharge orifice of the fire fighting liquid conduit."

Notwithstanding the somewhat different wording, applicant submits that the above arguments as directed to the elements of representative nozzle claim 1 apply equally, if not more so, to the similarly numbered elements of the three independent method claims.

For these reasons, and in view of the above amendments, this application is now considered to be in condition for allowance and such action is earnestly solicited.

Applicants have made a diligent effort to place the claims in condition for allowance. However, should there remain unresolved issues that require adverse action, it is respectfully requested that the Examiner telephone Sue Z. Shaper, Applicants' Attorney at 713 550 5710 so that such issues may be resolved as expeditiously as possible.

Respectfully Submitted,

12/12/6
Date

Sue Z. Shaper
Attorney/Agent for Applicant(s)
Reg. No. 31663

Sue Z. Shaper
1800 West Loop South, Suite 1450
Houston, Texas 77027
Tel. 713 550 5710